E 3510-22-P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648-XC802]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Whittier Head of the Bay Cruise Ship Dock Project in Whittier, Alaska

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; issuance of an incidental harassment authorization.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that NMFS has issued an Incidental Harassment Authorization (IHA) to Turnagain Marine Construction (TMC) to incidentally harass marine mammals during construction associated with the Whittier Head of the Bay cruise ship dock project in Whittier, Alaska.

DATES: This authorization is effective from April 1, 2023, through March 31, 2024.

FOR FURTHER INFORMATION CONTACT: Jenna Harlacher, Office of Protected Resources, NMFS, (301) 427-8401. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: *https://www.fisheries.noaa.gov/action/incidental-take-authorization-turnagain-marine-constructions-cruise-dock-construction*. In case of problems accessing these documents, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Background

The MMPA prohibits the "take" of marine mammals, with certain exceptions. Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq*.) direct the Secretary

of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are proposed or, if the taking is limited to harassment, a notice of a proposed IHA is provided to the public for review.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other "means of effecting the least practicable adverse impact" on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stocks for taking for certain subsistence uses (referred to in shorthand as "mitigation"); and requirements pertaining to the mitigation, monitoring and reporting of the takings are set forth. The definitions of all applicable MMPA statutory terms cited above are included in the relevant sections below.

Summary of Request

On September 16, 2022, NMFS received a request from TMC for an IHA to take marine mammals incidental to the construction of the cruise ship dock in Whittier, Alaska. Following NMFS' review of the application, TMC provided further information on October 26, 2022, a revised application on January 9, 2023, and the application was deemed adequate and complete on January 10, 2023. Subsequently, TMC submitted an additional update to its application on February 3, 2023. The proposed IHA published for public comment on February 13, 2023 (88 FR 9227). TMC's request is for take of five species of marine mammals by Level B harassment and, for a subset of two species,

Level A harassment. Neither TMC, nor NMFS expect serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

Description of Activity

TMC plans to construct the Whittier Head of the Bay cruise ship dock project in the Passage Canal in Whittier, Alaska. The planned project will cover a 12-month window during which approximately 129 days of pile-installation and -removal activity will occur. This project involves installation and removal of seventy-two 36-inch (in) (0.91-meter (m)) temporary steel pile guides and installation of thirty-six 36-in (0.91-m), sixteen 42-in (1.1-m), and twenty 48-in (1.2-m) permanent steel piles. Three different installation methods will be used including vibratory installation of piles into dense material, impact pile driving to drive piling to tip elevation, and the Down-the-Hole (DTH) hammer to drill pile into the bedrock. TMC will deploy a bubble curtain to the 60-foot (ft) (18.3-m) isobath. This will be used during all activities that fall below the 60-ft (18.3-m) isobath. Sounds resulting from pile installation, removal, and drilling may result in the incidental take of marine mammals by Level A and Level B harassment in the form of auditory injury or behavioral harassment.

A further detailed description of the planned construction project is provided in the **Federal Register** notice for the proposed IHA (88 FR 9777, February 13, 2023). Since that time, no changes have been made to the planned activities. Therefore, a detailed description is not provided here. Please refer to that **Federal Register** notice for the description of the specified activity. Mitigation, monitoring, and reporting measures are described in detail later in this document (please see Mitigation and Monitoring and Reporting).

Comments and Responses

A notice of NMFS' proposal to issue an IHA to TMC was published in the **Federal Register** on February 13, 2023 (88 FR 9777). That notice described, in detail,

TMC's activity, the marine mammal species that may be affected by the activity, and the anticipated effects on marine mammals. During the 30-day public comment period, no public comments were received.

Changes from the Proposed IHA to Final IHA

Changes were made between publication of the notice of proposed IHA and this notice of final IHA. Changes have been made to correct typographical errors to Tables 4, 5, and 8 in the proposed **Federal Register** notice; however, the proposed IHA at the time of publishing was correct. Additionally, text regarding a 35-m (114.83-ft) minimum shutdown zone was removed and replaced with the applicant's specified minimum shutdown zones that reflects the zones included in Table 8. Lastly, reasoning for the killer whale take calculation and shutdown zones for impact pile driving was included to correctly reflect what was included in the proposed notice.

Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of the application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history of the potentially affected species. NMFS fully considered all of this information, and we refer the reader to these descriptions, incorporated here by reference, instead of reprinting the information. Additional information regarding population trends and threats may be found in NMFS' Stock Assessment Reports (SARs; *www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*) and more general information about these species (*e.g.*, physical and behavioral descriptions) may be found on NMFS' website (*https://www.fisheries.noaa.gov/find-species)*.

Table 1 lists all species or stocks for which take is expected and authorized for this activity, and summarizes information related to the population or stock, including regulatory status under the MMPA and Endangered Species Act (ESA) and potential

biological removal (PBR), where known. PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS' SARs). While no serious injury or mortality is anticipated or authorized here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species or stocks and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS' stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All stocks managed under the MMPA in this region are assessed in NMFS' U.S. 2021 SARs (*e.g.*, Muto *et al.*, 2021) and the draft 2022 SARs (*e.g.*, Young *et al.*, 2022). All values presented in Table 1 are the most recent available at the time of publication and are available online at: *www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*).

Table 1 - Species Likely Impacted by the Specified Activities

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N)[1]	Stock abundance (CV, Nmin, most recent abundance survey)[2]	PBR	Annual M/SI[3]
Order Cetartiodactyla – Cetacea – Superfamily Mysticeti (baleen whales)						
Family Balaenopteridae (rorquals)						
Humpback whale	*Megaptera novaeanglinae*	Central North Pacific Stock	-,D,Y	10,103 (0.3, 7,890, 2006)	83	26
		Western North Pacific	E,D,Y	1,107 (0.3, 865, 2006)	3	2.8
		California/Oregon/Washington	T,D,Y	4,973 (0.05, 4,776, 2018)	28.7	48.3
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae						

Killer whale	*Orca orcinus*	Alaska Resident	-,-,N	1,920 (N/A, 1,920, 2019)	19	1.3
		Gulf of Alaska/Aleutian Islands/Bering Sea Transient	-,-,N	587 (N/A, 587, 2012)	5.9	0.8
		AT1 Transient	-,D,Y	7 (N/A, 7, 2019)	0.01	1
Family Phocoenidae (porpoises)						
Dall's porpoise[4]	*Phocoenoides dalli*	Alaska Stock	-,-,N	15,432 (0.097, 13, 110, 2021)	131	37
Order Carnivora – Superfamily Pinnipedia						
Family Otariidae (eared seals and sea lions)						
Steller sea lion	*Eumetopias jubatus*	Western Stock	E,D,Y	52,932 (N/A, 52,932, 2019)	318	254
Family Phocidae (earless seals)						
Harbor seal	*Phoca vituline richardii*	Clarence Strait Stock	-,-,N	27,659 (N/A, 24,854, 2015)	746	40

1 - Endangered Species Act (ESA) status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

2 - NMFS marine mammal stock assessment reports online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports* CV is coefficient of variation; Nmin is the minimum estimate of stock abundance.

3 - These values, found in NMFS' SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (*e.g.*, commercial fisheries, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value or range. A CV associated with estimated mortality due to commercial fisheries is presented in some cases.
4 – Previous abundance estimates covering the entire stock's range are no longer considered reliable and the current estimates presented in the SARs and reported here only cover a portion of the stock's range. Therefore, the calculated Nmin and PBR is based on the 2015 survey of only a small portion of the stock's range. PBR is considered to be biased low since it is based on the whole stock whereas the estimate of mortality and serious injury is for the entire stock's range.

On January 24, 2023, NMFS published the draft 2022 SARs (*https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region*). The Alaska and Pacific Ocean SARs include a proposed update to the humpback whale stock structure. The new structure, if finalized, would modify the MMPA-designated stocks to align more closely with the ESA-designated Distinct Population Segments (DPS). Please refer to the draft 2022 Alaska and Pacific Ocean SARs for additional information.

NMFS Office of Protected Resources, Permits and Conservation Division has generally considered peer-reviewed data in draft SARs (relative to data provided in the most recent final SARs), when available, as the best available science, and has done so here for all species and stocks, with the exception of a new proposal to revise humpback whale stock structure. Given that the proposed changes to the humpback whale stock

structure involve application of NMFS' Guidance for Assessing Marine Mammals Stocks and could be revised following consideration of public comments, it is more appropriate to conduct our analysis in this authorization based on the status quo stock structure identified in the most recent final SARs (2021; Muto *et al.,* 2022).

As indicated above, all five species (with eight managed stocks) in Table 1 temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur, and we have authorized it. All species that could potentially occur in the planned project areas are included in Table 1 of the IHA application. While some species have been reported in or near the area, it is very rare, and the temporal and/or spatial occurrence of these species is more likely outside of the Passage Canal and outside of the harassment zones. Therefore, given this information take is not expected to occur and they are not discussed further beyond the explanation provided here.

A detailed description of the species likely to be affected by TMC's construction project, including brief introductions to the species and relevant stocks as well as available information regarding population trends and threats, and information regarding local occurrence, were provided in the **Federal Register** notice for the proposed IHA (88 FR 9777, February 13, 2023); since that time, we are not aware of any changes in the status of these species and stocks; therefore, detailed descriptions are not provided here. Please refer to that **Federal Register** notice for these descriptions. Please also refer to the NMFS website (*https://www.fisheries.noaa.gov/find-species*) for generalized species accounts.

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Not all marine mammal species have

equal hearing capabilities (*e.g.*, Richardson *et al.*, 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007, 2019) recommended that marine mammals be divided into hearing groups based on directly measured (behavioral or auditory evoked potential techniques) or estimated hearing ranges (behavioral response data, anatomical modeling, *etc*.). Note that no direct measurements of hearing ability have been successfully completed for mysticetes (*i.e*., low-frequency cetaceans). Subsequently, NMFS (2018) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 decibel (dB) threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. Marine mammal hearing groups and their associated hearing ranges are provided in Table 2.

Table 2 - Marine Mammal Hearing Groups (NMFS, 2018)

Hearing Group	Generalized Hearing Range*
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 35 kHz
Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz
High-frequency (HF) cetaceans (true porpoises, *Kogia*, river dolphins, Cephalorhynchid, *Lagenorhynchus cruciger* & *L. australis*)	275 Hz to 160 kHz
Phocid pinnipeds (PW) (underwater) (true seals)	50 Hz to 86 kHz
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals)	60 Hz to 39 kHz

***** Represents the generalized hearing range for the entire group as a composite (*i.e.*, all species within the group), where individual species' hearing ranges are typically not as broad. Generalized hearing range chosen based on ~65 dB threshold from normalized composite audiogram, with the exception for lower limits for LF cetaceans (Southall *et al.* 2007) and PW pinniped (approximation).

The pinniped functional hearing group was modified from Southall *et al*. (2007) on the basis of data indicating that phocid species have consistently demonstrated an

extended frequency range of hearing compared to otariids, especially in the higher frequency range (Hemilä *et al*., 2006; Kastelein *et al*., 2009; Reichmuth and Holt, 2013).

For more detail concerning these groups and associated frequency ranges, please see NMFS (2018) for a review of available information.

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

The effects of underwater noise from the TMC's pile driving activities have the potential to result in behavioral harassment of marine mammals in the vicinity of the project area. The notice of the proposed IHA (88 FR 9777, February 13, 2023) included a discussion of the effects of anthropogenic noise on marine mammals and the potential effects of underwater noise from the TMC's pile driving activities on marine mammals and their habitat. That information and analysis is incorporated by reference into this final IHA determination and is not repeated here; please refer to the notice of the proposed IHA (88 FR 9777, February 13, 2023).

Estimated Take of Marine Mammals

This section provides an estimate of the number of incidental takes authorized through this IHA, which will inform both NMFS' consideration of "small numbers," and the negligible impact determinations.

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines "harassment" as any act of pursuit, torment, or annoyance, which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes will primarily be by Level B harassment, as use of the acoustic sources (*i.e*., vibratory or impact pile driving and DTH) has the potential to result in

disruption of behavioral patterns for individual marine mammals. There is also some potential for auditory injury (Level A harassment) to result for Dall's porpoise and harbor seals, due to the cryptic nature of these species in the context of large predicted auditory injury zones. Auditory injury is unlikely to occur for low- and mid-frequency species and otariids, based on the likelihood of the species in the action area, the ability to monitor the entire smaller shutdown zone, and because of the expected ease of detection for the former groups. The mitigation and monitoring measures are expected to minimize the severity of the taking to the extent practicable.

As described previously, no serious injury or mortality is anticipated or authorized for this activity. Below we describe how the take numbers are estimated.

For acoustic impacts, generally speaking, we estimate take by considering: (1) acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) the number of days of activities. We note that while these factors can contribute to a basic calculation to provide an initial prediction of potential takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.*, previous monitoring results or average group size). Below, we describe the factors considered here in more detail and present the take estimates.

Acoustic Thresholds

NMFS recommends the use of acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur Permanent Threshold Shift (PTS) of some degree (equated to Level A harassment).

Level B Harassment – Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source or exposure context (*e.g.*, frequency, predictability, duty cycle, duration of the exposure, signal-to-noise ratio, distance to the source), the environment (*e.g.*, bathymetry, other noises in the area, predators in the area), and the receiving animals (hearing, motivation, experience, demography, life stage, depth) and can be difficult to predict (*e.g.*, Southall *et al.,* 2007, 2021, Ellison *et al.*, 2012). Based on what the available science indicates and the practical need to use a threshold based on a metric that is both predictable and measurable for most activities, NMFS typically uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS generally predicts that marine mammals are likely to be behaviorally harassed in a manner considered to be Level B harassment when exposed to underwater anthropogenic noise above root-mean-squared pressure received levels (RMS SPL) of 120 dB (referenced to 1 micropascal (re 1 μPa)) for continuous (*e.g.*, vibratory pile driving, drilling) and above RMS SPL 160 dB re 1 μPa for non-explosive impulsive (*e.g.*, seismic airguns) or intermittent (*e.g.*, scientific sonar) sources. Generally speaking, Level B harassment take estimates based on these behavioral harassment thresholds are expected to include any likely takes by Temporary Threshold Shift (TTS) as, in most cases, the likelihood of TTS occurs at distances from the source less than those at which behavioral harassment is likely. TTS of a sufficient degree can manifest as behavioral harassment, as reduced hearing sensitivity and the potential reduced opportunities to detect important signals (conspecific communication, predators, prey) may result in changes in behavior patterns that would not otherwise occur.

TMC's activity includes the use of continuous (vibratory hammer and DTH) and impulsive (DTH and impact pile-driving) sources, and therefore the 120 and 160 dB re 1 μPa (rms) thresholds are applicable.

Level A harassment – NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (Technical Guidance, 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). TMC's activity includes the use of impulsive (impact pile-driving and DTH) and non-impulsive (vibratory hammer and DTH) sources.

These thresholds are provided in the table below. The references, analysis, and methodology used in the development of the thresholds are described in NMFS' 2018 Technical Guidance, which may be accessed at: *www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance*.

Table 3 - Thresholds Identifying the Onset of Permanent Threshold Shift

	PTS Onset Acoustic Thresholds* (Received Level)	
Hearing Group	**Impulsive**	**Non-impulsive**
Low-Frequency (LF) Cetaceans	*Cell 1* $L_{pk,flat}$: 219 dB $L_{E,LF,24h}$: 183 dB	*Cell 2* $L_{E,LF,24h}$: 199 dB
Mid-Frequency (MF) Cetaceans	*Cell 3* $L_{pk,flat}$: 230 dB $L_{E,MF,24h}$: 185 dB	*Cell 4* $L_{E,MF,24h}$: 198 dB
High-Frequency (HF) Cetaceans	*Cell 5* $L_{pk,flat}$: 202 dB $L_{E,HF,24h}$: 155 dB	*Cell 6* $L_{E,HF,24h}$: 173 dB
Phocid Pinnipeds (PW) (Underwater)	*Cell 7* $L_{pk,flat}$: 218 dB $L_{E,PW,24h}$: 185 dB	*Cell 8* $L_{E,PW,24h}$: 201 dB
Otariid Pinnipeds (OW) (Underwater)	*Cell 9* $L_{pk,flat}$: 232 dB $L_{E,OW,24h}$: 203 dB	*Cell 10* $L_{E,OW,24h}$: 219 dB

* Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds should also be considered.

Note: Peak sound pressure (L_{pk}) has a reference value of 1 μPa, and cumulative sound exposure level (L_E) has a reference value of 1μPa^{2}s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript "flat" is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (*i.e.*, varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.

Ensonified Area

Here, we describe operational and environmental parameters of the activity that are used in estimating the area ensonified above the acoustic thresholds, including source levels and transmission loss coefficient.

The sound field in the project area is the existing background noise plus additional construction noise from the planned project. Marine mammals are expected to be affected via sound generated by the primary components of the project (*i.e.*, impact pile driving, vibratory pile driving and removal, and DTH).

In order to calculate distances to the Level A harassment and Level B harassment thresholds for the methods and piles being used in this project, NMFS used acoustic monitoring data from other locations to develop source levels for the various pile types, sizes, and methods (Table 4). Additionally, a bubble curtain will be deployed at a depth of 60-ft (18.3-m) and will be used during all activities that fall within the 60-ft (18.3-m) isobath. Therefore, a 5 dB reduction is applied to the estimated sound source levels for driving these piles only (Caltrans, 2020).

Table 4 – Observed Source Levels for Pile Installation and Removal

Pile size, Method	**SPL (dB)**	**SEL (dB)**	**Reference**
Bubble Curtain in use (depths of 60 ft or less)			

36-in steel pile, Vibratory Installation (temporary)	161 RMS**		U.S. Navy 2015
36-in steel pile, Vibratory Removal (temporary)	161 RMS**		U.S. Navy 2015
36-in steel pile, DTH Installation (temporary) *	169 RMS**	159 SEL**	Denes *et al.,* 2019; Guan and Miner, 2020; Reyff and Heyvaert, 2019; Reyff, 2020; Heyvaert and Reyff, 2021
36-in steel pile, Vibratory Installation (permanent)	161 RMS**		U.S. Navy 2015
36-in steel pile, Impact Installation (permanent)	187 RMS**	179 SEL**	U.S. Navy 2015
36-in steel pile, DTH Installation (permanent)*	169 RMS**	159 SEL**	Denes *et al.,* 2019; Guan and Miner, 2020; Reyff and Heyvaert, 2019; Reyff, 2020; Heyvaert and Reyff, 2021
No Bubble Curtain (depths greater than 60 ft)			
36-in steel pile, Vibratory Installation (temporary)	166 RMS		U.S. Navy 2015
36-in steel pile, Vibratory Removal (temporary)	166 RMS		U.S. Navy 2015
42-in steel pile, Vibratory Installation	168.2 RMS		Austin et al. 2016
48-in steel pile, Vibratory Installation	168.2 RMS		Austin et al. 2016
42-in steel pile, Impact Installation	198.6 RMS	186.7 SEL	Austin et al. 2016
48-in steel pile, Impact Installation	198.6 RMS	186.7 SEL	Austin et al. 2016
36-in steel pile, DTH Installation (temporary)	174 RMS	164 SEL	Denes *et al.,* 2019; Guan and Miner, 2020; Reyff and Heyvaert, 2019; Reyff, 2020; Heyvaert and Reyff, 2021
42-in steel pile, DTH Installation*	174 RMS	164 SEL	Denes *et al.,* 2019; Guan and Miner, 2020; Reyff and Heyvaert, 2019; Reyff, 2020; Heyvaert and Reyff, 2021
48-in steel pile, DTH Installation*	174 RMS	171 SEL	Denes *et al.,* 2019; Guan and Miner, 2020; Reyff and Heyvaert, 2019; Reyff, 2020; Heyvaert and Reyff, 2021

Note: SELss = single strike sound exposure level; RMS = root mean square

*Source levels here differ from those used in TMC's application as NMFS has updated their acoustic guidance on DTH, resulting in larger Level B harassment SPLs

(*https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance#other-nmfs-acoustic-thresholds-and-tools*).
**Attenuated source levels with 5dB reduction due to use of a bubble curtain during these activities (Caltrans, 2020; Austin *et al.*, 2016).

NMFS recommends treating DTH systems as both impulsive and continuous, non-impulsive sound source types simultaneously. Thus, impulsive thresholds are used to evaluate Level A harassment, and continuous thresholds are used to evaluate Level B harassment. With regards to DTH mono-hammers, NMFS recommends proxy levels for Level A harassment based on available data regarding DTH systems of similar sized piles and holes (Denes *et al.,* 2019; Guan and Miner, 2020; Reyff and Heyvaert, 2019; Reyff, 2020; Heyvaert and Reyff, 2021).

Level B Harassment Zones

Transmission loss (TL) is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for underwater TL is:

$TL = B * \log_{10} (R_1 / R_2)$,

Where:

TL = transmission loss in dB

B = transmission loss coefficient; for practical spreading equals 15

R_1 = the distance of the modeled SPL from the driven pile, and

R_2 = the distance from the driven pile of the initial measurement.

The recommended TL coefficient for most nearshore environments is the practical spreading value of 15. This value results in an expected propagation environment that lies between spherical and cylindrical spreading loss conditions, which is the most appropriate assumption for TMC's planned activities. The Level B harassment zones and areas of zones of influence (ZOIs) for the planned activities are shown in Table 5.

Level A Harassment Zones

The ensonified area associated with Level A harassment is more technically challenging to predict due to the need to account for a duration component. Therefore, NMFS developed an optional User Spreadsheet tool to accompany the Technical Guidance that can be used to relatively simply predict an isopleth distance for use in conjunction with marine mammal density or occurrence to help predict potential takes. We note that because of some of the assumptions included in the methods underlying this optional tool, we anticipate that the resulting isopleth estimates are typically going to be overestimates of some degree, which may result in an overestimate of potential take by Level A harassment. However, this optional tool offers the best way to estimate isopleth distances when more sophisticated modeling methods are not available or practical. For stationary sources, such as pile installation or removal, the optional User Spreadsheet tool predicts the distance at which, if a marine mammal remained at that distance for the duration of the activity, it would be expected to incur PTS. The isopleths generated by the User Spreadsheet used the same TL coefficient as the Level B harassment zone calculations (*i.e.*, the practical spreading value of 15). Inputs used in the User Spreadsheet (*e.g.*, number of piles per day, duration and/or strikes per pile) are presented in Table 1 of the notice of the proposed IHA (88 FR 9777, February 13, 2023). The maximum RMS SPL, SEL, and resulting isopleths are reported in Table 4 and 5.

Table 5 - Level A and Level B Harassment Isopleths for Pile Driving Activities

Activity	**Level A harassment zone (m)**					**Level B harassment zone (m)**
	LF cetacean	MF cetacean	HF cetacean	Phocids	Otariids	
Bubble Curtain in use (depths of 60 ft or less)						
36-in steel pile, Vibratory Installation (temporary)	5.2	0.5	7.7	3.2	0.2	5,412

36-in steel pile, Vibratory Removal (temporary)	5.2	0.5	7.7	3.2	0.2	5,412
36-in steel pile, DTH Installation (temporary)	681.1	24.5	820.9	368.8	26.9	18,479*
36-in steel pile, Vibratory Installation (permanent)	6.8	0.6	10.1	4.2	0.3	5,412
36-in steel pile, Impact Installation (permanent)	2,015.1	71.7	2,400.3	1,078.4	78.5	631
36-in steel pile, DTH Installation (permanent)*	799.7	28.4	952.6	428	31.2	18,479*
No Bubble Curtain (depths greater than 60 ft)						
36-in steel pile, Vibratory Installation (temporary)	11.2	1	16.6	6.8	.05	11,659
36-in steel pile, Vibratory Removal (temporary)	11.2	1	16.6	6.8	.05	11,659
42-in steel pile, Vibratory Installation	20.6	1.8	30.5	12.5	0.9	16,343
48-in steel pile, Vibratory Installation	13	1.2	19.2	7.9	0.6	16,343
42-in steel pile, Impact Installation	6,570.9	233.7	7,827	3,516.4	256	3,744
48-in steel pile, Impact Installation	5,014.6	178.4	5,973.1	2,683.6	195.4	3,744

36-in steel pile, DTH Installation (temporary)	1,484.7	52.8	1,768.5	794.6	57.9	39,811*
42-in steel pile, DTH Installation*	1,722.9	61.3	2,052.2	922	67.1	39,811*
48-in steel pile, DTH Installation*	5,045.7	179.5	6,010.2	2,700.2	196.6	39,811*

*Differs from TMC's application due to difference in source level use. See Table 4.

Marine Mammal Occurrence

In this section we provide information about the occurrence of marine mammals, including presence, local knowledge, group dynamics, or other relevant information, that will inform the take calculations. We also describe how the information provided above is brought together to produce a quantitative take estimate.

Available information regarding marine mammal occurrence and abundance in the vicinity of the Passage Canal includes local knowledge, previous marine construction projects in the Whittier area, and available scientific literature. A summary of authorized take is in Table 7. To accurately describe species occurrence near the action area, marine mammals were described as either common or infrequent.

To obtain more accurate estimates of potential take by Level B harassment, TMC estimated an hourly occurrence probability of each marine mammal species in the action area rather than a weekly or daily estimation, since pile driving activities will not occur over an entire day, but rather over a certain number of hours. Occurrence probability estimates are based on conservative density approximations for each species and factor in historic data of occurrence, seasonality, and group size in the Passage Canal and/or nearby Prince William Sound.

Assumptions for these hourly estimations were that common species (Steller sea lion, harbor seal) would have two group sightings per day in the Passage Canal, and infrequent species would have three group sightings per week in the Passage Canal, or

slightly fewer than one group sighting every two days (Table 6). In these estimations, a sighting does not equal one animal; a sighting equals one group of each particular species or stock. To standardize observation estimates across species, these numbers were distilled down to obtain the hourly occurrence probability for each species. Additionally, one day was equated to 12 hours rather than 24 hours to obtain a rough estimate of observations during daylight hours when pile driving and project activities will occur, and to obtain more conservative estimates of species occurrence. TMC states that this hourly estimate provides a more accurate representation of actual possible takes in Passage Bay.

Table 6 – Estimated Occurrence of Group Sighting of Marine Mammals

Species Occurrence in the Action Area	Group Sighting Occurrence Estimate		
	Weekly	Daily	Hourly
Common (Steller sea lion, harbor seal)	14	2	0.17
Infrequent (humpback whale, Dall's porpoise, killer whale)	3	0.5	0.04

Take Estimation

Here we describe how the information provided above is synthesized to produce a quantitative estimate of the take that is reasonably likely to occur and authorized.

Take was estimated using the hourly occurrence probability for each species, which was multiplied by the estimated group size and by the number of hours of each type of pile driving activity for total take estimate.

For species infrequently seen in Passage Canal (humpback whale, Dall's porpoise, and killer whale) and rarely seen close to the project location, only hours of pile driving for DTH and vibratory driving were used to calculate these species take estimates. Impact pile driving was excluded from these analyses because the Level A harassment isopleth

was larger than the Level B harassment isopleth for low- and high-frequency cetaceans, and therefore construction will be shut down before they approach the Level B harassment zone. However, for killer whales, impact pile driving was excluded because killer whales are an infrequent visitor to Passage Canal and often highly visible. For impact pile driving, TMC will conservatively apply thresholds for high frequency cetaceans to killer whales. This precautionary measure will reduce potential impacts to the highly vulnerable AT-1 killer whale stock that is found in this region should they enter the Passage Canal during the in-water work period.

Take by Level A harassment is also requested for Dall's porpoise and harbor seals given their frequency in the action area, the large Level A harassment zones for HF cetaceans and phocids, the possibility they may not be seen in the water before pile driving could be shut down, and the fact that Level A harassment isopleths for certain pile driving activities extend to Whittier Seafood's outfall, a known marine mammal foraging area.

The take calculations for Level A harassment are based on the occurrence estimate for the species in the largest Level B harassment zone (16,343 meters) reduced by a factor for each smaller Level A harassment isopleth. While NMFS updated the DTH source levels, resulting in DTH having the largest Level B harassment isopleth, the shoreline is limited in Passage Canal and the largest practical Level B harassment isopleth is the one used by TMC for the original calculation of take by Level A harassment. Therefore, the updated DTH values do not impact the take calculation. The Level A harassment isopleth for each species and specific activity was divided by the largest Level B harassment isopleth (16,343 m), giving a species multiplier per hour for occurrence in the smaller Level A harassment isopleth. This was multiplied by the number of hours of the specific activity type, giving the estimate for take by Level A harassment during that activity. For example, the Level A harassment isopleth for phocid

pinnipeds during impact pile driving of 36-in steel piles is 2,323 meters, so Level B harassment estimates are multiplied by a factor of 0.14 (2,323/16,343 = 0.14) to estimate take in the Level A harassment zone. All take by Level A harassment was conservatively calculated using isopleths from unattenuated source levels. Take by Level B harassment was calculated based on occurrence estimates for the area encompassed by the largest isopleth generated by unattenuated source levels (*i.e.*, all of Passage Canal).

Additionally, the shutdown zone for phocid pinnipeds was decreased compared to the calculated zone for pile driving activities that encompassed the public boat harbor approximately 1,500 meters away due to the possibility of harbor seals using the area as a haulout. The shutdown zone was reduced to 1,360-m for impact pile driving 42- and 48-in pile sizes and DTH drilling of 48-in piles and the calculated take by Level A harassment has been doubled for this species.

Table 7 – Authorized Amount of Taking and Percent of Stock

Species	Stock	Average Group Size	Take by Level A harassment	Take by Level B harassment	Total Take	Percent of Stock
Humpback whale	Hawaii DPS	2.4	0	22	22	<1
	WNP DPS		0	1	1	<1
	Mexico DPS		0	2	2	<1
Dall's Porpoise	Alaska	4.3	9	36	45	<1
Killer Whale*	Alaska Resident	14	0	116	116	6
	GOA/Aleutian Islands/Bering Sea Transient		0	29	29	4.9
Harbor Seal	Prince William Sound	3.5	40	170	210	<1
Steller Sea Lion	Western U.S.	4	0	218	218	<1

*AT1 transient stock take calculation resulted in 0 takes, therefore no takes were requested or are authorized.

Mitigation

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to the activity, and other means of effecting the least practicable impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stock for taking for certain subsistence uses. NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting the activity or other means of effecting the least practicable adverse impact upon the affected species or stocks, and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, NMFS considers two primary factors:

(1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat, as well as subsistence uses. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (probability implemented as planned); and

(2) The practicability of the measures for applicant implementation, which may consider such things as cost, and impact on operations.

Mitigation Measures

TMC must follow mitigation measures as specified below:

- Ensure that construction supervisors and crews, the monitoring team, and relevant TMC staff are trained prior to the start of all pile driving and DTH activity, so that responsibilities, communication procedures, monitoring protocols, and operational procedures are clearly understood. New personnel joining during the project must be trained prior to commencing work;
- Employ Protected Species Observers (PSOs) and establish monitoring locations as described in the application, the Marine Mammal Monitoring Plan, and the IHA. The Holder must monitor the project area to the maximum extent possible based on the required number of PSOs, required monitoring locations, and environmental conditions. For all pile driving and removal at least one PSO must be used. The PSO will be stationed as close to the activity as possible;
- The placement of the PSOs during all pile driving and removal and DTH activities will ensure that the entire shutdown zone is visible during pile installation. Should environmental conditions deteriorate such that marine mammals within the entire shutdown zone will not be visible (*e.g.*, fog, heavy rain), pile driving and removal must be delayed until the PSO is confident marine mammals within the shutdown zone could be detected;
- Monitoring must take place from 30 minutes prior to initiation of pile driving or DTH activity (*i.e.*, pre-clearance monitoring) through 30 minutes post-completion of pile driving or DTH activity;
- Pre-start clearance monitoring must be conducted during periods of visibility sufficient for the lead PSO to determine that the shutdown zones indicated in Table 8 are clear of marine mammals. Pile driving and DTH may commence following 30 minutes of observation when the determination is made that the shutdown zones are clear of marine mammals;

- TMC must use soft start techniques when impact pile driving. Soft start requires contractors to provide an initial set of three strikes at reduced energy, followed by a 30-second waiting period, then two subsequent reduced-energy strike sets. A soft start must be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of 30 minutes or longer; and
- If a marine mammal is observed entering or within the shutdown zones indicated in Table 8, pile driving and DTH must be delayed or halted. If pile driving is delayed or halted due to the presence of a marine mammal, the activity may not commence or resume until either the animal has voluntarily exited and been visually confirmed beyond the shutdown zone (Table 8) or 15 minutes have passed without re-detection of the animal;
- As planned by the applicant, in water activities will take place only between civil dawn and civil dusk when PSOs can effectively monitor for the presence of marine mammals; during conditions with a Beaufort Sea State of 4 or less; when the entire shutdown zone and adjacent waters are visible (*e.g.*, monitoring effectiveness in not reduced due to rain, fog, snow, *etc*.). Pile driving may continue for up to 30 minutes after sunset during evening civil twilight, as necessary to secure a pile for safety prior to demobilization during this time. The length of the post-activity monitoring period may be reduced if darkness precludes visibility of the shutdown and monitoring zones.

Shutdown Zones

TMC will establish shutdown zones for all pile driving activities. The purpose of a shutdown zone is generally to define an area within which shutdown of the activity will occur upon sighting of a marine mammal (or in anticipation of an animal entering the

defined area). Shutdown zones will be based upon the Level A harassment zone for each pile size/type and driving method where applicable, as shown in Table 8.

TMC will apply a minimum shutdown zone of 10-m for all pile driving related activities using a bubble curtain. For pile driving related activities without a bubble curtain, the minimum shutdown zone for cetaceans is 35-m and for pinnipeds is 15-m.

Further, there will be a nominal 10-m shutdown zone for construction activity where acoustic injury is not the primary concern. This type of work could include (but is not limited to) the following activities: movement of the barge to the pile location; positioning of the pile on the substrate via a crane (*i.e.*, stabbing the pile); and removal of the pile from the water column/substrate via a crane (*i.e.*, deadpull). This 10-m zone applies for physical safety of marine mammals to prevent interaction with equipment. If an activity is delayed or halted due to the presence of a marine mammal, the activity may not commence or resume until either the animal has voluntarily exited and been visually confirmed beyond the shutdown zone indicated in Table 8 or 15 minutes have passed without re-detection of the animal. Construction activities must be halted upon observation of a species for which incidental take is not authorized or a species for which incidental take has been authorized but the authorized number of takes has been met entering or within the harassment zone.

All marine mammals will be monitored in the Level B harassment zones and throughout the area as far as visual monitoring can take place. If a marine mammal enters the Level B harassment zone, in-water activities will continue and the animal's presence within the estimated harassment zone will be documented.

TMC will also establish shutdown zones for all marine mammals for which take has not been authorized or for which incidental take has been authorized but the authorized number of takes has been met. These zones are equivalent to the Level B harassment zones for each activity. If a marine mammal species not covered under this

IHA enters the shutdown zone, all in-water activities will cease until the animal leaves the zone or has not been observed for at least 1 hour, and NMFS will be notified about species and precautions taken. Pile removal will proceed if the non-authorized species is observed to leave the Level B harassment zone or if 1 hour has passed since the last observation.

If shutdown and/or clearance procedures will result in an imminent safety concern, as determined by TMC or its designated officials, the in-water activity will be allowed to continue until the safety concern has been addressed, and the animal will be continuously monitored.

Table 8 – Shutdown Zones and Monitoring Zones

Activity	**Minimum shutdown zone**					**Harassment Zone**
	Low-Frequency (LF) Cetaceans	**Mid-Frequency (MF) Cetaceans**	**High-Frequency (HF) Cetaceans**	**Phocid**	**Otariid**	
Barge movements, pile positioning, etc.	10	10	10	10	10	--
Bubble Curtain in use (depths of 60-ft or less)						
36-in steel pile, Vibratory Installation (temporary)	10	10	10	10	10	5,415
36-in steel pile, Vibratory Removal (temporary)	10	10	10	10	10	5,415
36-in steel pile, DTH Installation (temporary)	700	35	825	370	35	16,345**
36-in steel pile, Vibratory Installation (permanent)	10	10	10	10	10	5,415

36-in steel pile, Impact Installation (permanent)	2,055	80[1]	2,400	1,100	80	635
36-in steel pile, DTH Installation (permanent)	800	35	1,000	430	35	16,345**
No Bubble Curtain (depths greater than 60-ft)						
36-in steel pile, Vibratory Installation (temporary)	35	35	35	15	15	11,660
36-in steel pile, Vibratory Removal (temporary)	35	35	35	15	15	11,660
42-in steel pile, Vibratory Installation	35	35	35	15	15	16,345
48-in steel pile, Vibratory Installation	35	35	35	15	15	16,345
42-in steel pile, Impact Installation	6,575	260[1]	7,830	1,360*	260	3,745
48-in steel pile, Impact Installation	5,015	200[1]	5,975	1,360*	200	3,745
36-in steel pile, DTH Installation (temporary)	1,485	70	1,770	795	70	16,345**
42-in steel pile, DTH Installation	1,770	70	2,055	925	70	16,345**
48-in steel pile, DTH Installation	5,050	200	6,015	1,360*	200	16,345**

* For phocids (harbor seals) only, the Level A shutdown zone will be reduced to 1,360 m for impact pile driving of 42- and 48-in piles and DTH drilling of 48-in piles to exclude the Whittier Public Boat Harbor.
**Differs from Table 5 Level B harassment zone for DTH because 18,479-m and 39,811-m extends longer than Passage Canal, so land masses will block sound transmission and distances will be truncated. It will also be impractical to monitor this whole zone outside of Passage Canal. Instead, DTH monitoring zone will be the entirety of the Passage Canal and equivalent to the largest Level B harassment zone.

[1]TMC has elected to conservatively apply thresholds for HF cetaceans to killer whales for impact pile driving. This species is an infrequent visitor to Passage Canal and is often highly visible, allowing for easier application of more conservative shutdown zones. This measure will reduce potential impacts to the highly vulnerable AT-1 killer whale stock that is found in this region should they enter Passage Canal during the in-water work period.

Protected Species Observers

The placement of PSOs during all construction activities (described in the **Monitoring and Reporting** section) will ensure that the entire shutdown zone is visible. Should environmental conditions deteriorate such that the entire shutdown zone would not be visible (*e.g.*, fog, heavy rain), pile driving will be delayed until the PSO is confident marine mammals within the shutdown zone could be detected.

PSOs will monitor the full shutdown zones and the remaining Level A harassment and the Level B harassment zones to the extent practicable. Monitoring zones provide utility for observing by establishing monitoring protocols for areas adjacent to the shutdown zones. Monitoring zones enable observers to be aware of and communicate the presence of marine mammals in the project areas outside the shutdown zones, and thus prepare for a potential cessation of activity should the animal enter the shutdown zone.

Pre-Activity Monitoring

Prior to the start of daily in-water construction activity, or whenever a break in pile driving of 30 minutes or longer occurs, PSOs will observe the shutdown and monitoring zones for a period of 30 minutes. The shutdown zone will be considered cleared when a marine mammal has not been observed within the zone for that 30-minute period. If a marine mammal is observed within the shutdown zones listed in Table 8, pile driving activity will be delayed or halted. If work ceases for more than 30 minutes, the pre-activity monitoring of the shutdown zones will commence. A determination that the shutdown zone is clear must be made during a period of good visibility (*i.e.*, the entire shutdown zone and surrounding waters must be visible to the naked eye).

Soft-Start Procedures

Soft-start procedures provide additional protection to marine mammals by providing warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. For impact pile driving, contractors will be required to provide an initial set of three strikes from the hammer at reduced energy, followed by a 30-second waiting period, then two subsequent reduced-energy strike sets. Soft-start will be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of 30 minutes or longer.

Bubble Curtain

A bubble curtain must be employed during all pile installation and removal in depths of 60 ft or less. The bubble curtain must be deployed in manner guaranteed to distribute air bubbles around 100 percent of the piling perimeter for the full depth of the water column. The lowest bubble ring must be in contact with the mudline for the full circumference of the ring. The weights attached to the bottom ring must ensure 100 percent mudline contact. No parts of the ring or other objects may prevent full mudline contact. Air flow to the bubblers must be balanced around the circumference of the pile.

Based on our evaluation of the applicant’s measures, as well as other measures considered by NMFS, NMFS has determined that the mitigation measures provide the means effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Monitoring and Reporting

In order to issue an IHA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104(a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species

and of the level of taking or impacts on populations of marine mammals that are expected to be present while conducting the activities. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density);
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the activity; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas);
- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors;
- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks;
- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat); and,
- Mitigation and monitoring effectiveness.

Visual Monitoring

Marine mammal monitoring must be conducted in accordance with the conditions in this section, the Monitoring Plan, and this IHA. Marine mammal monitoring during

pile driving activities will be conducted by PSOs meeting NMFS' the following requirements:

- Independent PSOs (*i.e.*, not construction personnel) who have no other assigned tasks during monitoring periods will be used;
- At least one PSO will have prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued incidental take authorization;
- Other PSOs may substitute education (degree in biological science or related field) or training for experience; and
- Where a team of three or more PSOs is required, a lead observer or monitoring coordinator will be designated. The lead observer will be required to have prior experience working as a marine mammal observer during construction.

PSOs must have the following additional qualifications:

- Ability to conduct field observations and collect data according to assigned protocols;
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates, times, and reason for implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior; and

- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary;
- TMC must employ up to four PSOs during all pile driving and DTH activities. A minimum of two PSOs (including the lead PSO) must be assigned to the active pile driving or DTH location to monitor the shutdown zones and as much of the Level B harassment zones as possible.
- TMC must establish the following monitoring locations with the best views of monitoring zones as described in the IHA and Marine Mammal Monitoring Plan.
- Two to four PSOs will be onsite during in-water activities associated with the Whittier Head of the Bay Cruise Ship Dock Project, likely stationed in the following locations PSOs will likely be located at Station 1: stationed just to the south of the site on the shore, Station 2: stationed off Depot Road near the freight loading dock, Station 3: stationed along the shoreline northeast of the Emerald Cove Trailhead, and Station 4: stationed on a boat triangulating an area between Emerald Island, the north shore of Passage Canal, southeast towards Gradual Point, and back southwest toward Trinity Point and Emerald Island as shown in Figure 8 of the Marine Mammal Monitoring Plan. All PSOs will have access to high-quality binoculars, range finders to monitor distances, and a compass to record bearing to animals as well as radios or cells phones for maintaining contact with work crews.

Monitoring will be conducted 30 minutes before, during, and 30 minutes after all in water construction activities. In addition, PSOs will record all incidents of marine mammal occurrence, regardless of distance from activity, and will document any behavioral reactions in concert with distance from piles being driven or removed. Pile driving activities include the time to install or remove a single pile or series of piles, as

long as the time elapsed between uses of the pile driving equipment is no more than 30 minutes.

TMC shall conduct briefings between construction supervisors and crews, PSOs, TMC staff prior to the start of all pile driving activities, and when new personnel join the work. These briefings will explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures.

Acoustic Monitoring

Acoustic monitoring must be conducted in accordance with the Acoustic Monitoring Plan. TMC must conduct hydroacoustic monitoring of two (one 36-in and one 48-in) piles each from different locations during DTH drilling.

Reporting

A draft marine mammal monitoring report will be submitted to NMFS within 90 days after the completion of pile driving and removal activities, or 60 days prior to a requested date of issuance from any future IHAs for projects at the same location, whichever comes first. The report will include an overall description of work completed, a narrative regarding marine mammal sightings, and associated PSO data sheets. Specifically, the report must include:

- Dates and times (begin and end) of all marine mammal monitoring;
- Construction activities occurring during each daily observation period, including the number and type of piles driven or removed and by what method (*i.e.*, impact, vibratory, or DTH) and the total equipment duration for vibratory removal or DTH for each pile or hole or total number of strikes for each pile (impact driving);
- PSO locations during marine mammal monitoring;
- Environmental conditions during monitoring periods (at beginning and end of PSO shift and whenever conditions change significantly), including Beaufort sea

state and any other relevant weather conditions including cloud cover, fog, sun glare, and overall visibility to the horizon, and estimated observable distance;

- Upon observation of a marine mammal, the following information:
    - Name of PSO who sighted the animal(s) and PSO location and activity at the time of sighting;
    - Time of sighting;
    - Identification of the animal(s) (*e.g.*, genus/species, lowest possible taxonomic level, or unidentifiable), PSO confidence in identification, and the composition of the group if there is a mix of species;
    - Distance and bearing of each marine mammal observed relative to the pile being driven for each sightings (if pile driving was occurring at time of sighting);
    - Estimated number of animals (min/max/best estimate);
    - Estimated number of animals by cohort (adults, juveniles, neonates, group composition, sex class, etc.);
    - Animal's closest point of approach and estimated time spent within the harassment zone; and
    - Description of any marine mammal behavioral observations (*e.g.*, observed behaviors such as feeding or traveling), including an assessment of behavioral responses thought to have resulted from the activity (*e.g.*, no response or changes in behavioral state such as ceasing feeding, changing direction, flushing, or breaching).
- Number of marine mammals detected within the harassment zones and shutdown zones; by species;

- Detailed information about any implementation of any mitigation triggered (*e.g.*, shutdowns and delays), a description of specific actions that ensured, and resulting changes in behavior of the animal(s), if any; and
- If visibility degrades to where PSO(s) cannot view the entire harassment zones, additional PSOs may be positioned so that the entire width is visible, or work will be halted until the entire width is visible to ensure that any humpback whales entering or within the harassment zone are detected by PSOs.

If no comments are received from NMFS within 30 days, the draft final report will constitute the final report. If comments are received, a final report addressing NMFS comments must be submitted within 30 days after receipt of comments.

Acoustic Monitoring Plan

The report must include:

- Type and size of pile being driven, substrate type, method of driving during recordings (including hammer model and energy setting(s)), total pile driving duration, and water depth at the pile;
- Whether a sound attenuation device is used and, if so, a detailed description of the device and the duration of its use per pile;
- Number of strikes and strike rate, depth of substrate to penetrate; pulse duration and mean, median, and maximum sound levels (dB re: 1 µPa); root mean square sound pressure level (SPLrms), peak sound pressure level (SPLpeak), cumulative sound exposure level (SELcum), and single strike exposure sound level (SEL s-s);
- One-third octave band spectrum and power spectral density plot for each pile monitored; and
- Environmental data, including but not limited to, the following: wind speed and direction, air temperature, humidity, surface water temperature, water depth, wave

height, weather conditions, and other factors that could contribute to influencing the airborne and underwater sound levels (*e.g.*, aircraft, boats, *etc*.).

Reporting Injured or Dead Marine Mammals

In the event that personnel involved in the construction activities discover an injured or dead marine mammal, the IHA-holder must immediately cease the specified activities and report the incident to the Office of Protected Resources (OPR) (*PR.ITP.MonitoringReports@noaa.gov*), NMFS and to the Alaska Regional Stranding Coordinator as soon as feasible. If the death or injury was clearly caused by the specified activity, TMC must immediately cease the specified activities until NMFS is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of the IHA. The IHA-holder must not resume their activities until notified by NMFS. The report must include the following information:

- Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
- Species identification (if known) or description of the animal(s) involved;
- Condition of the animal(s) (including carcass condition if the animal is dead);
- Observed behaviors of the animal(s), if alive;
- If available, photographs or video footage of the animal(s); and
- General circumstances under which the animal was discovered.

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of

the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be "taken" through harassment, NMFS considers other factors, such as the likely nature of any impacts or responses (*e.g.*, intensity, duration), the context of any impacts or responses (*e.g.*, critical reproductive time or location, foraging impacts affecting energetics), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS' implementing regulations (54 FR 40338, September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

To avoid repetition, our analysis applies to all species listed in Table 1 for which take could occur, given that NMFS expects the anticipated effects of the pile driving/removal and DTH on different marine mammal stocks to be similar in nature. Where there are meaningful differences between species or stocks, or groups of species, in anticipated individual responses to activities, impact of expected take on the population due to differences in population status, or impacts on habitat, NMFS has identified species-specific factors to inform the analysis.

Pile driving and DTH activities associated with the project, as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level B harassment and, for some species, Level A harassment from underwater sounds generated by pile driving activities. Potential takes could occur if individuals are present in the ensonified zone when these activities are underway.

No serious injury or mortality is expected, even in the absence of required mitigation measures, given the nature of the activities. Further, no take by Level A harassment is anticipated for humpback whales, killer whales, or Steller sea lion due to the application of planned mitigation measures, such as shutdown zones that encompass the Level A harassment zones for these species and the rarity of these species near the action area. The potential for harassment would be minimized through the construction method and the implementation of the planned mitigation measures (see Mitigation section).

Take by Level A harassment is authorized for two species (Dall's porpoise and harbor seal) as the Level A harassment zones exceed the size of the shutdown zones for specific construction scenarios. Additionally, these species could be found more often near the action area and are cryptic in nature. Therefore, there is the possibility that an animal could enter a Level A harassment zone without being detected, and remain within that zone for a duration long enough to incur PTS. Level A harassment of these species is authorized to be conservative. Any take by Level A harassment is expected to arise from, at most, a small degree of PTS (*i.e.*, minor degradation of hearing capabilities within regions of hearing that align most completely with the energy produced by impact pile driving such as the low-frequency region below 2 kHz), not severe hearing impairment or impairment within the ranges of greatest hearing sensitivity. Animals would need to be exposed to higher levels and/or longer duration than are expected to occur here in order to incur any more than a small degree of PTS.

Further, the amount of take by Level A harassment authorized is very low for both marine mammal stocks and species. If hearing impairment occurs, it is most likely that the affected animal will lose only a few decibels in its hearing sensitivity. Due to the small degree anticipated, any PTS potential incurred will not be expected to affect the

reproductive success or survival of any individuals, much less result in adverse impacts on the species or stock.

Additionally, some subset of the individuals that are behaviorally harassed could also simultaneously incur some small degree of TTS for a short duration. However, since the hearing sensitivity of individuals that incur TTS is expected to recover completely within minutes to hours, it is unlikely that the brief hearing impairment would affect the individual's long-term ability to forage and communicate with conspecifics, and will therefore not likely impact reproduction or survival of any individual marine mammal, let alone adversely affect rates of recruitment or survival of the species or stock.

The Level A harassment zones identified in Table 5 are based upon an animal exposed to pile driving or DTH up to four piles per day. Given the short duration to impact drive or vibratory install or extract, or use DTH drilling on each pile, and breaks between pile installations (to reset equipment and move piles into place), an animal will have to remain within the area estimated to be ensonified above the Level A harassment threshold for multiple hours. This is highly unlikely give marine mammal movement in the area. If an animal was exposed to accumulated sound energy, the resulting PTS will likely be small (*e.g.*, PTS onset) at lower frequencies where pile driving energy is concentrated, and unlikely to result in impacts to individual fitness, reproduction, or survival.

The nature of the pile driving project precludes the likelihood of serious injury or mortality. For all species and stocks, take will occur within a limited, confined area (adjacent to the project site) of the stock's range. Level A and Level B harassment will be reduced to the level of least practicable adverse impact through use of mitigation measures described herein. Further, the amount of take authorized is extremely small when compared to stock abundance.

Behavioral responses of marine mammals to pile driving, pile removal, and DTH at the sites in the Passage Canal are expected to be mild, short term, and temporary. Marine mammals within the Level B harassment zones may not show any visual cues they are disturbed by activities or they could become alert, avoid the area, leave the area, or display other mild responses that are not observable such as changes in vocalization patterns. Given that pile driving, pile removal, and DTH will occur for only a portion of the project's duration, any harassment occurring will be temporary. Additionally, many of the species present in region will only be present temporarily based on seasonal patterns or during transit between other habitats. These temporary present species will be exposed to even smaller periods of noise-generating activity, further decreasing the impacts.

For all species, there are no known Biologically Important Areas (BIAs) near the project area that will be impacted by TMC's planned activities. While southcentral Alaska is considered an important area for feeding humpback whales between March and May (Ellison *et al.*, 2012), it is not currently designated as critical habitat for humpback whales (86 FR 21082, April 21, 2021).

In addition, it is unlikely that minor noise effects in a small, localized area of habitat will have any effect on each stock's ability to recover. In combination, we believe that these factors, as well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activities will have only minor, short-term effects on individuals. The specified activities are not expected to impact rates of recruitment or survival and will therefore not result in population-level impacts.

In summary and as described above, the following factors primarily support our determination that the impacts resulting from this activity are not expected to adversely affect the species or stock through effects on annual rates of recruitment or survival:

- No serious injury or mortality is anticipated or authorized;

- Authorized Level A harassment will be very small amounts and of low degree;
- Level A harassment takes of only Dall's porpoise and harbor seals;
- For all species, the Passage Canal is a very small and peripheral part of their range;
- The intensity of anticipated takes by Level B harassment is relatively low for all stocks. Level B harassment will be primarily in the form of behavioral disturbance, resulting in avoidance of the project areas around where impact or vibratory pile driving is occurring, with some low-level TTS that may limit the detection of acoustic cues for relatively brief amounts of time in relatively confined footprints of the activities;
- Effects on species that serve as prey for marine mammals from the activities are expected to be short-term and, therefore, any associated impacts on marine mammal feeding are not expected to result in significant or long-term consequences for individuals, or to accrue to adverse impacts on their populations;
- The ensonified areas are very small relative to the overall habitat ranges of all species and stocks, and will not adversely affect ESA-designated critical habitat for any species or any areas of known biological importance;
- The lack of anticipated significant or long-term negative effects to marine mammal habitat; and
- TMC will implement mitigation measures including soft-starts and shutdown zones to minimize the numbers of marine mammals exposed to injurious levels of sound, and to ensure that take by Level A harassment is, at most, a small degree of PTS.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the monitoring and mitigation measures, NMFS finds that the total marine mammal take from the planned activity will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted previously, only take of small numbers of marine mammals may be authorized under sections 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. When the predicted number of individuals to be taken is fewer than one-third of the species or stock abundance, the take is considered to be of small numbers. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

The amount of take NMFS plans to authorize is below one-third of the estimated stock abundance for all species (in fact, take of individuals is less than five percent of the abundance of the affected stocks, see Table 7). This is likely a conservative estimate because we assume all takes are of different individual animals, which is likely not the case. Some individuals may return multiple times in a day, but PSOs will count them as separate takes if they cannot be individually identified.

Additionally, the most recent estimate for the Alaska stock of Dall's porpoise was 13,110 animals; however this number just accounts for a portion of the stock's range. Therefore, the 45 takes of this stock planned for authorization is believed to be an even smaller portion of the overall stock abundance.

Based on the analysis contained herein of the planned activity (including the mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

In order to issue an IHA, NMFS must find that the specified activity will not have an "unmitigable adverse impact" on the subsistence uses of the affected marine mammal species or stocks by Alaskan Natives. NMFS has defined "unmitigable adverse impact" in 50 CFR 216.103 as an impact resulting from the specified activity: (1) That is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by: (i) Causing the marine mammals to abandon or avoid hunting areas; (ii) Directly displacing subsistence users; or (iii) Placing physical barriers between the marine mammals and the subsistence hunters; and (2) That cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.

The Alutiiq and Eyak people of Prince William Sound traditionally harvested marine mammals, however the last recorded harvest of marine mammals in Whittier was in 1990, where it was reported that seven marine mammals were harvested (ADF&G 2022b). Other Prince William Sound coastal communities such as Cordova, Chenega, and Tatitlek report recent subsistence harvest or use of marine mammals. The most recent report of harbor seal and Steller sea lion harvest was reported in Tatitlek in 2014 (ADF&G 2022b).

Subsistence hunters in Prince William Sound report having to travel farther from their home communities to be successful when harvesting marine mammals (Keating *et al.* 2020). However, their range was not reported to extend into Passage Canal, as all three communities are located at least 60 miles away by boat (Fall and Zimpelman 2016).

The planned project is not likely to adversely impact the availability of any marine mammal species or stocks that are commonly used for subsistence purposes or to impact subsistence harvest of marine mammals in the region because:

- Construction activities are localized and temporary;
- Mitigation measures will be implemented to minimize disturbance of marine mammals in the action area; and,
- The project will not result in significant changes to availability of subsistence resources.

Based on the description of the specified activity, the measures described to minimize adverse effects on the availability of marine mammals for subsistence purposes, and the mitigation and monitoring measures, NMFS has determined that there will not be an unmitigable adverse impact on subsistence uses from TMC's planned activities.

Endangered Species Act

Section 7(a)(2) of the Endangered Species Act of 1973 (ESA: 16 U.S.C. 1531 *et seq*.) requires that each Federal agency insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the issuance of IHAs, NMFS consults internally whenever we propose to authorize take for endangered or threatened species, in this case with the Alaska Regional Office.

NMFS is authorizing take of Western U.S. Steller Sea Lion, Western North Pacific Humpback whale, and the California/Oregon/Washington Humpback whale, which are listed under the ESA.

The Permit and Conservation Division completed a Section 7 consultation with the Alaska Regional Office for the issuance of this IHA. The Alaska Regional Office's

biological opinion states that the action is not likely to jeopardize the continued existence of the listed species.

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq*.) and NOAA Administrative Order (NAO) 216-6A, NMFS must review our proposed action (*i.e.*, the issuance of an IHA) with respect to potential impacts on the human environment.

This action is consistent with categories of activities identified in Categorical Exclusion B4 (IHAs with no anticipated serious injury or mortality) of the Companion Manual for NOAA Administrative Order 216-6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has determined that the issuance of the IHA qualifies to be categorically excluded from further NEPA review.

Authorization

As a result of these determinations, NMFS issues an IHA to TMC for conducting Whittier head of the Bay Cruise Ship Dock project in Whittier, Alaska, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. The IHA can be found at: *https://www.fisheries.noaa.gov/action/incidental-take-authorization-turnagain-marine-constructions-cruise-dock-construction.*

Dated: March 29, 2023.

Catherine Marzin,

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National Marine Fisheries Service.

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